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March 6, 1997

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Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W. - Room 222
Washington, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Re: Notice of Ex Parte Presentation, In the Matter of the Universal Service, Joint Board CC Docket No. 96-45

Dear Mr. Caton:

On December 20, 1995, the State of Arizona released the attached national study, "Universal Service To Universal Access: The Paradigm Shift In Citizens' Use of Telecommunications," which I authored for them under contract. It has come to my attention that this study would be helpful to you as a part of your deliberations in CC Docket 96-45 on Universal Service and I am now officially filing the study in this docket.

Please acknowledge receipt hereof by affixing a notation on the duplicate copy of this letter furnished herewith for such purposes and remitting same to bearer. Also please feel free to call on me if I may be of any further assistance in supporting your investigation and consideration of these and related matters.

Sincerely,

Mark Goldstein
President
International Research Center

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UNIVERSAL SERVICE TO UNIVERSAL ACCESS

THE PARADIGM SHIFT IN CITIZENS' USE OF TELECOMMUNICATIONS

State of Arizona

Contract No. A6-0028-001

by

Mark Goldstein and

Richard Z. Gooding, Ph.D.

**International Research Center
Tempe, Arizona**

December 20, 1995

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State of Arizona Contract No. A6-0028-001

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And finally, much appreciation to the members of the Arizona Telecommunications and Information Council (ATIC) and John Kelly, the first to head the Arizona Governor's Office of Telecommunications Policy. May you lead Arizona with vision, foresight and determination through the shifting paradigms of the transition to the Information Age.

Universal Service to Universal Access

The Paradigm Shift in Citizens' Use of Telecommunications

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Universal Service to Universal Access

The Paradigm Shift in Citizens' Use of Telecommunications

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Every few hundred years, throughout Western history, a sharp transformation has occurred. In a matter of decades, society rearranges itself. Its world view, its basic values, its social and political structures, its arts and institutions. Fifty years later, a new world exists. Our age is such a period of transition.

Peter Drucker in the Harvard Business Review

STATE OF ARIZONA
GOVERNOR'S OFFICE
OF TELECOMMUNICATIONS POLICY

FIFE SYMINGTON
GOVERNOR

JOHN B. KELLY
EXECUTIVE DIRECTOR

PREFACE

When the Governor's Office of Telecommunications Policy was created, its organic mission included the development of strategies to ensure that the benefits associated with information technology would be broadly available to all of Arizona's citizens. The issues of Universal Service and Universal Access present extraordinary challenges to state policy makers. But the rewards of meeting those challenges will be rich indeed.

This study, performed with speed and professionalism by International Research Center of Tempe, Arizona, establishes an unprecedented foundation of data and thought on the topic of Universal Access. It assesses our past, our current day efforts, and then begins to explore the possibilities in our future.

The implications of policy decisions in this area are enormous. They will affect the future directions of education, health care, social services, and economic development. Our best hope lies in strategies that work within the constraints of a competitive marketplace with a minimum of distortions.

The opportunity for creative policy solutions is at hand. This superbly researched and prepared document will give Arizona's policy makers the tools they need to make informed and visionary decisions.

John B. Kelly
Executive Director

Executive Summary:

Our most successful experiments with universal access have been with telephony and broadcasting. And now more homes have TV sets than have indoor plumbing. And an extremely high percentage of homes have telephone services, even in poor and rural areas. To the extent that that service approaches universality, the value to every customer is enhanced. To the extent that digital services available over broader bandwidth connections become as crucial to the America of the next century as telephone service has been during this last half-century, the definition of Universal Service should expand. Just as with telephony, the higher the percentage of homes and businesses that can access and afford a connection to the so-called information superhighway, the more valuable that resource is to every home and every business.

Al Gore, Vice President of the United States, in *Forbes* ASAP, December 4, 1995

Arizona is in the midst of vast change driven by advances in telecommunications technology. In the last decade, telecommunications and technology companies have provided new means of information delivery and human interaction, new types of investment and infrastructure, new reliance and expectations on the part of consumers and businesses alike. The next decade promises more of the same. The bandwidth of fiber optic cable, the flexibility of wireless signal delivery, the ubiquity of the personal computer as information appliance, the great global net of interconnectivity will drive the evolution of new applications, markets, governmental responsibilities and even social structures beyond what most may imagine.

As basic phone service became more common and access to it became increasingly important to modern life, the desire to make that access available to all led to the development of Universal Service in telecommunications. For most of this century it has aided rural communities as well as low income and disabled individuals to enjoy the benefits of basic telephone connectivity with its ability to reach out to the world beyond. The definition of Universal Service has remained relatively stable until recently. The rapid pace and scope of developments in telecommunications are forcing a reevaluation as the marketplace moves towards deregulation, the number of competitors increase, and more advanced services are developed and deployed. Access to Information Age services and resources is becoming as important today as access to basic telephony was in earlier times. Thus, the concept of Universal Service must evolve in order to continue aiding those segments of the population with special needs.

Today, we struggle to operate under the legal framework of laws, regulation and court decisions that oversaw the telecommunications industry in a simpler and more stable era. Now increasingly outmoded for the more complex environment in which we find ourselves, some of the necessary changes become evident. With a multiplicity of market entrants and methods of telecommunications service delivery, the dismantling of some long standing government oversight and control is necessary to reduce the regulatory burden and let markets develop and flourish. However, there remain areas in which government must still protect the public interests, where the government must review and renew its delivery of services and finally, where the government must reengineer itself, utilizing modern models and tools, to meet these needs in a cost effective manner.

The purpose of this study, as mandated by the Arizona Legislature in 1995, is to inform and guide the Legislature and other public policy participants in developing Arizona's telecommunications policy by:

- Reviewing the historical context in which Universal Service developed
- Describing the current status of Federal and state government programs designed to implement and manage Universal Service
- Analyzing the potential significance and impact of pending Federal legislative and FCC initiatives
- Examining the issues states are debating now and key initiatives that have surfaced to redefine and expand the scope of traditional Universal Service

To determine the current state of Universal Service and the best thinking on its future, International Research Center interviewed Commissioners or senior staff members from the Public Utility Commissions of each state and the District of Columbia. These interviews provided a wealth of data on the current programs, pending changes and future thoughts of each states' regulatory scene. Individual state reports may be found in Appendix E, but the comparison and analysis of these interviews combined with state demographic data appears in the section Universal Service Around the Nation.

To augment this regulatory focused perspective, we reviewed a vast array of published literature, consisting of books, articles, position papers and industry analyses to glean current thinking and trends on Universal Service and related issues. In addition, many government agencies, industry trade associations, telecommunications providers, academic and public policy institutes were contacted to provide background, references, publications and their current thinking. We incorporated that material throughout this document and provide appendixes containing the bibliography and a telecommunications policy resource guide to aid further investigation in this rapidly evolving environment. In addition, we invited position statements from over a hundred organizations and enterprises, resulting in twenty nine submittals representing a wide variety of views and interests, available for your review in Appendix D.

An analysis is presented of the importance of telecommunications infrastructure and applications to regional economic development, the prosperity derived from developing and retaining high technology industry, and the rise of the virtual corporation. Then, to better enable the public policy reader to look beyond the horizon, we survey Data Points, Trends and Portents, showing the range of services and applications now available, their market penetration, likely competitive entrants, and what one might expect to see in the future. Hopefully, this will prove an aid in understanding the increasingly vital role advanced telecommunication services is coming to play in the life and livelihood of the average citizen.

The expected adoption of rules next year by the Arizona Corporation Commission should establish a formal and well structured Arizona Universal Service Fund that is designed to accommodate the entry of competitive providers into the local exchange market. Arizona will join some 16 other states with well established programs. Notably, some states have expanded the scope of Universal Service by utilizing excess revenues or fines imposed on carriers for service quality issues, to fund access to advanced services. Arizona should pursue its ability to act in a similar manner. Pending Federal legislative and Federal Communications Commission initiatives may soon play a significant role in tuning and redefining the traditional Universal Service concept, though it remains unlikely that they will sufficiently broaden its reach to incorporate a full range of advanced telecommunication and information applications.

The individual states can take the initiative in the transition of Universal Service to Universal Access by promoting the availability of public information, always essential to the fostering of democracy and development, as well as insuring access to such information and advanced telecommunications services to their rural communities and to their public institutions, and through those institutions to the citizenry at large. States can not provide or fund all the necessary advances and should look to public-private partnerships to help advance the deployment of services and the ubiquity of access desired. States can also foster market-sensitive approaches by policies that reduce regulatory barriers and by designing incentives to encourage service providers and market forces to bring new services to the broadest possible consumer base, retaining to as great an extent as possible equity in available services and costs across rural as well as urban areas.

Development and Institutionalizing of Universal Service:

Historical Context:

The term "Universal Service" was introduced in 1907 by Theodore Vail, then President of AT&T. However, in the early twentieth century it had quite a different meaning in practice. Due to basic incompatibility or a lack of interconnection, competing local phone companies could often not connect their respective customers to each other. "Dual service" or subscribing to both services with the attendant duplicate wiring and equipment was common, especially for businesses. Thus, Universal Service at first meant compatibility and interconnectivity of competing phone services that we today take for granted. It was only later that the term "Universal Service" became associated with a social compact to connect those disadvantaged by geography, income or other factors.

The Mann-Elkins Act of 1910 gave regulatory jurisdiction for interstate telecommunications to the Interstate Commerce Commission (ICC), defining telephone companies as "common carriers" who were "to provide service on request at just and reasonable rates, without unjust discrimination or undue preference." The Communications Act of 1934, though not naming "Universal Service" specifically, lays out its basic tenets "so as to make available, so far as possible, to all people of the United States a rapid, efficient, nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges." Establishing the separate Federal Communications Commission, the act gave the commission new powers to regulate tariffs and services but expressly limited federal authority to interstate service. In 1994, the sixtieth anniversary of the Communications Act of 1934, President Bill Clinton said:

When President Franklin D. Roosevelt signed this historic legislation so many years ago, few realized the dramatic changes in communications that the future would hold. Yet that stroke of the pen ushered in the beginnings of the Information Age, an era in which vast amounts of knowledge flow freely across continents and circle the globe in a matter of seconds.

Today, as we celebrate the vision of the authors of the Communications Act, we are still defining the role that telecommunications technology will play in our society. With a universe of electronic information at our fingertips, we can better educate our people, promote democracy, save lives, and create jobs across America. As we work to enhance the partnership between the public and private sectors, we continue to draw inspiration from the original Communications Act, which has long served to benefit all of our citizens and to propel our nation into the future.

(Federal Communications Law Journal, Vol. 47, No. 2, December, 1994)

There subsequently developed a series of programs, structures and protocols to encourage and enforce the expectation that basic local and long distance telephone service be available to all. The major components insuring ubiquitous availability of plain old telephone service (POTS) and other consumer services such as "free" broadcasting have been as follows:

Universal Service Fund (USF):

The Federal Communications Commission (FCC), anticipating the breakup of the Bell System, established the National Exchange Carrier Association (NECA) in 1983 as a membership association of local telephone companies. NECA is a non-profit company directly regulated by the FCC to establish and administer interstate access revenues, access charge pooling and administer the Universal Service Fund (USF) to provide assistance to telephone companies in high-cost areas (primarily rural, but defined as those with costs in excess of 115 percent of the national average). The funds are collected from major long distance carriers and administered and dispensed by NECA. The funds are used to extend telephone service to previously unserved areas, help pay for system extensions and to keep basic rates low.

Due to concerns about the Universal Service Fund's overall growth rate and annual growth fluctuations, the FCC adopted interim rules in December 1993 imposing an indexed cap on Fund payments for 1994 and 1995 pending completion of a broader proceeding on reforming the high cost area telephone assistance program. The USF expense adjustment for 1994 was projected as \$741.5 million, however it was limited by a cap of \$725.4 million. The USF expense adjustment for 1995 was projected as \$777 million and capped at \$749.2 million. The Arizona USF assistance for 1995 (capped) is \$14.5 million.

NECA has had a policy of encouraging the investments of small telephone companies in new technologies. In their most recent study of telecommunications infrastructure (1993) covering 1194 small telephone companies, NECA tracked the deployment of fiber optics, digital switching and digital services. The study revealed that, despite their limited customer base and fairly broad service areas, NECA member companies continue a high rate of investment in modern central office switching, outside plant and signaling systems. Over 65 percent of these small telephone company customers had equal access to competitive long distance carriers up from 35 percent in 1991 (the FCC reports in February 1995 a 90% conversion for independent phone companies) and over 91 percent had access to digital switching.

An evolving definition of Universal Service should be the foundation of a future national telecommunications policy. With technological advances making new services more affordable, subscribers are no longer content with "plain old telephone service." No community should be denied the opportunity to participate in and benefit from this exciting new network of the future.

NECA 1993 Study - Building the Telecommunications Infrastructure of Rural America

Lifeline Assistance Programs - SLC Waivers and Link-Up America:

The Lifeline Assistance Programs are designed to aid low income residential subscribers. Again, funds are collected from long distance carriers and administered by NECA. Each state decides whether to participate and its public utility commission sets policies and guidelines governing the specific program implementation in that state.

As of April, 1989, the Subscriber Line Charge (SLC) for all residential subscribers to the public switched network rose from \$1.00 to \$3.50. To prevent subscribers from being forced off the network, the FCC established an SLC waiver program in 1985 where those customers meeting a state determined means test would have the full SLC charge waived if the state provided an equal reduction in either local service charges, connection charges or deposit requirements. NECA reports that in 1994, the SLC waiver fund was \$123.4 million providing an average \$2.34 per month in assistance to 4.4 million subscribers in the 35 participating states, the District of Columbia and the Virgin Islands. In Arizona, 9,146 subscribers benefited from \$308,402 in SLC waiver subsidies last year.

The second program, Link-Up America, attempts to reduce the entry barrier for new low income subscribers by paying half the cost of telephone installation and connection charges up to \$30. Though the participants must again qualify under a state determined means test, the state is not required to further contribute to reducing the hookup costs. A second part of the program covers the interest charges for any deferred payment plan on installation and startup costs that the telephone company provides (within specified limits). NECA reports that in 1994, the Link-Up America program fund of \$18.6 million covered 839,470 subscribers in the 48 participating states, the District of Columbia, Puerto Rico, and the Virgin Islands. In Arizona, 367 subscribers benefited from \$8,533 in Link-Up America subsidies last year.

Various studies have shown that these Lifeline Assistance programs have indeed had positive effects in getting subscribers onto the networks and in keeping them connected. States not participating in either program have shown lower level of total subscribership, especially for those households on public assistance.

U.S. Department of Agriculture Rural Telecommunications Financing:

Since 1949, the Rural Electrification Administration (REA) of the United States Department of Agriculture (USDA) has provided loans to small telephone companies serving rural areas to assure the availability of affordable, high quality service. Approximately 950 loans have been provided at interest rates below market, even below the cost of money to the government. This has led to over 96 percent of U.S. farms having telephone service and allowed the formation and survival of many small rural telephone companies as cooperatives. These coops would otherwise be unlikely to raise sufficient capital to initially build or modernize without access to such subsidized loans. If original qualified borrowers are acquired by larger telephone companies, these firms can continue to receive subsidized capital to modernize their rural areas.

Still, for the estimated 65 million Americans living in rural communities, problems remain with access to advanced telecommunications services. Most rural Americans still find online and Internet access prohibitively expensive since they must pay for a long-distance call to the nearest "point of presence." Further, while almost 80% of libraries in cities over 250,000 inhabitants have some Internet connectivity, only 17% of rural libraries do. The availability of high speed connections (i.e. - ISDN, frame relay, T-1, T-3) for rural institutions and businesses usually lags urban availability within a region, though some small LECs are upgrading faster than the BOCs.

The USDA's Rural Utilities Service (RUS) in FY 1994, used \$12.2 million in funds to generate more than \$500 million in Federal loans and loan guarantees, which in turn leveraged \$2 billion in private investment in rural telecommunications infrastructure. In a typical year, RUS borrowers provide initial telecommunications services to over 62,000 families, install 6,000 miles of fiber optic cable, and purchase over 200 new digital switches. RUS also has a Distance Learning and Medical Link Grant Program which in FY 1994 made \$10 million in grants to rural schools and health care providers to connect them to the National Information Infrastructure leveraged with an additional \$15 million of private investments. They have proposed a new \$100 million loan program for FY 1996 to further finance their goals of rural connectivity. The U.S. Department of Health and Human Services (HHS) also has a Rural Telemedicine Grant Program managed by their Office of Rural Health Policy. (Source: USDA RUS publications)

In addition, the USDA is developing a new Rural Business Telecommunications Partnership Loan Program to leverage government loans with rural investment capital to fund locally shared, end-user telecommunications facilities. The purpose of this program is to provide access to advanced telecommunications services and computer networks to improve rural job opportunities, stimulate local economies, and give rural businesses the opportunity to compete nationally and globally. An industry trade association, the National Rural Telecom Association (NRTA) has as its primary role the preservation of REA's role as the major provider of funds for rural telephone services.

Rate Averaging and Internal Cross-Subsidization:

State Public Utility Commissions require Local Exchange Carriers to charge the same rate for residences located throughout the often large geographic areas that each serves. This reallocates the actual costs to equalize or average rates across the LEC's service area independent of customer density and distance from switching offices, in effect subsidizing high-cost rural customers.

The Local Exchange Carriers are also closely regulated by the states as to approved tariffs, price caps and rate of return on their investments. LECs are allowed to charge fees above their cost for providing access to long distance carriers and the toll services charged to residential subscribers, with these revenues used to hold down the cost of basic residential service.

Assistive Technology for the Disabled:

Many Americans have physical disabilities which require special consideration in telecommunications as well as in other areas. With the growing percentage of older Americans, it's likely that the need for enhanced services and assistive technology will grow. In 1990, Congress passed the Americans with Disabilities Act (ADA) mandating the availability of interstate and intrastate telecommunications relay services to aid individuals with hearing and speech disabilities. In 1994, the Technology-Related Assistance Act was reauthorized. The United States has established the principles of a disability policy that stress inclusion, not exclusion; independence, not dependence; and empowerment, not paternalism.

The FCC adopted standards for Telecommunications Relay Service (TRS) providers, set forth a state certification program and appointed the National Exchange Carrier Association (NECA) to administer a fund. All common carriers contribute to the TRS fund on the basis of their interstate revenues. TRS providers then draw from the fund and include local telephone companies, long distance companies, state relay agencies and non-profit agencies operating state TRS programs. In operation, the individual with hearing or speech disability uses a text telephone (TTY) to call a toll-free TRS provider. A Communications Assistant (CA) then acts as speaking intermediary in placing the call to the intended destination and mediating the communication between the parties. States often oversee the availability and distribution of TTY terminals. Also, in most states, there are reduced telephone rates for handicapped subscribers and directory assistance charges are waived.

The FCC has long required that pay phones and emergency phones be compatible with hearing aids. Under a current proposal, most business telephones would be required to be hearing aid compatible by January 1, 2000 and existing business phone systems upgraded by 2005. Because this compatibility refers to the placement of an electromagnetic coil in telephone handsets, it is only effective with the estimated 1.8 million users of hearing aids containing a complementary electromagnetic coil (T-Coil). It does nothing for the balance of the 6 million hearing aid users (out of a total of 28 million Americans with hearing loss), but volume amplification controls and other technological solutions can offer some assistance.

The mandating of closed-captioning capability for most new television sets also aids the hearing impaired with the textual display of a programs audio content for an increasing proportion of the television programming delivered. A side benefit of such text displays can be the teaching or augmentation of reading skills to those not proficient in the English language.

Broadcast Radio and Television:

Broadcast radio followed by television has primarily been sent out to the public at no cost, being supported by advertisers (or in the case of public radio and television by government, public institutions, sponsors and listeners). Once one bought the receiving radio or television, the only residual cost was a modest amount of electrical power. Some of the same rural availability issues remain, but by and large, consumers have had free access to an enormous wealth (some would say dearth) of programming material. The advent of cable television altered the model, charging a basic fee for connection and programming as well as premium fees for extended services, however local broadcast options have remained free and available. Satellite broadcasting to consumers with dishes now down to 18 inches in size and sold for less than \$600, helps solve rural access by equalizing access costs (though the entry barrier still remains too high for the economically disadvantaged). Though not part of the formal definition of Universal Service, and largely unidirectional in information and entertainment delivery, these broadcast mediums have set the stage for consumer expectations, broad media and visual literacy, and more advanced, interactive services to come.

Libraries as Public Repositories and Access Points:

As we approach the 21st century, a momentous telecommunications revolution is taking place. Electronic technology can help you find a job in another state or read the Congressional Record online. It can connect a student to the local library or the Library of Congress.

But what if that child's parents or school can't afford a computer? What if you don't have one in your home or don't know how to use one? The information superhighway promises vast riches of information, but it also threatens to widen the gulf between "information rich" and "information poor." Our forefathers and mothers knew it made good sense to invest in libraries as a shared community resource for books. It makes even more sense to support libraries in acquiring the powerful and expensive technology needed to obtain electronic information.

Nothing is more important to the future of democracy than ensuring public access to information. That is why we need our nation's public, school, college and university libraries online. The technological revolution is happening **now**. And now is the time to support your library and all libraries in their efforts to ensure equity on the information superhighway.

Betty J. Turock, President, 1995-96, American Library Association (ALA)

Public libraries have long supported the continuing education of the common man and the essential values of lifelong access to informational resources for education, business pursuits and literary entertainment. In recent years, libraries have increasingly automated access to their "card catalogs" allowing more accurate and versatile entry to their wealth of resources. In many cases, they have or will soon have public dial-in (and/or Internet) access to their card catalogs and other online resources, so one may explore a libraries holdings remotely before one visits. Trends in recent years have been to enhance publicly available collections with both audio and video material for loan, but also to have CD-ROM or other computer accessible information resources available to the visiting public at terminals and computer workstations or even by remote dial-in access. Hard copy serial collections are frequently reduced to pay for electronic versions of journals and magazines, but often a broader range of materials become available as the access becomes more precise and efficient. In the future, government entities will make increasing volumes of public information available but may or may not provide the means of access (i.e. - public kiosks), thus libraries seem the most logical venue to invest in and develop so as to support and expand public access to advanced information resources.

Pending Federal Legislative and FCC Initiatives:

Tantalizingly close to toppling the cable/telco cross-ownership ban once and for all, Local Exchange Carriers wait for the courts, Congress and/or the FCC to cut them loose from legal limbo. The inevitable march at the federal level toward opening the video marketplace has competitors scrambling to ensure anti-competitive safeguards are in place. State and local governments also are sounding warnings that they have jurisdiction over intraLATA services and they don't intend to see their authority preempted.

Deborah Ely, Washington Editor in America's Network, February 15, 1995

Is the 1995-96 legislative session the year that the Communications Act of 1934 is finally updated? Attempts last session faltered and no action was taken. The same may happen again. On June 15, 1995 the Senate approved telecommunications reform legislation, S. 652 by a vote of 81 - 18. On August 4, 1995 the House approved its version H.R. 1555 by a vote of 305 - 117 including the Manager's Amendment which substantially alters some of the original intent. A conference committee has been

selected consisting of 11 senators and 9 representatives, though an additional 25 House members will participate in portions of the negotiations for a total of 45 conferees.

The outcome remains uncertain and this session is proving a busy one with the budget crisis, welfare reform, Bosnian peacekeeping efforts and other issues at the fore. Even if the conference committee produces a bill that both houses can and do pass, the president has threatened a veto over cable rate deregulation, media concentration, and the terms under which the RBOCs can enter the long distance market. The total federal legislative telecommunications reform effort is enormously complex with wide-ranging implications beyond the scope of this study. We will concentrate here on elements that concern the role and evolution of Universal Service.

Both the Senate and House versions direct a Federal-State Joint Board, comprised of three federal and four state representatives, to recommend a definition of and funding mechanisms for Universal Service to the FCC. The House version includes an additional state appointed utility consumer advocate representative. After enactment of legislation, the Board has 270 days to submit its recommendations and the FCC one year to complete any related proceedings. The House bill gives the Board a five year life shifting oversight to the FCC, whereas the Senate envisions an ongoing role.

Both measures seek to promote "reasonably comparable services for the general public in urban and rural areas, while maintaining just and reasonable rates." The Senate version goes farther in asserting that "access to advanced telecommunications and information services should be provided in all regions of the Nation" and that "citizens in rural and high cost areas should have access to the benefits of advanced telecommunication and information services for health care, education, economic development, and other public purposes." In advancing those goals, the Senate version provides for special telecommunication access rates for rural health care facilities, most schools and libraries. While the House bill directs the Joint Board to recommend "specific and predictable mechanisms to provide adequate and sustainable support for Universal Service" and requires that all carriers make "equitable and nondiscriminatory contribution," the Senate version is more specific regarding contributions to and payments from a Universal Service fund. Senator John McCain of Arizona had offered a failed amendment that would have replaced the current system with a need-based voucher system, though the conference committee may revisit this proposal.

While both bills seek to address the difficult definition of future Universal Service capabilities, the Senate version is more forward looking and adaptive in requiring that the determination of included service elements be driven by "advances in telecommunications and information services" which "are essential for Americans to participate effectively in the economic, academic, medical, and democratic processes of the Nation." The Senate bill also allows the states to provide for additional conditions to advance Universal Service as long as these additions are paid for by the state and don't conflict with Federal rules. The Manager's Amendment to H.R. 1555 requires that the interest on escrow deposits received by the FCC for its spectrum auctions be used to establish a Telecommunications Development Fund. The fund would provide access to capital (as the REA does for rural telcos) for small businesses in order to enhance competition in the telecommunications industry. The Manager's Amendment further allows states to waive the rural telco exemption from interconnection/unbundling requirements and changes the standard of access by the disabled from "undue burden" to "readily achievable."

I voted for this important legislation because it seeks to promote competition in practically all telecommunications markets. It also reduces the federal regulatory burden on communications firms. As a result of more competition and less regulation, American consumers will benefit from a greater choice of telecommunications services with lower prices and higher quality than is presently available. The legislation will allow local telephone companies to compete with cable companies to supply video services to homes across America. Once local telephone loops are open to competition, Bell operating companies would be allowed to compete in long distance and

manufacturing markets. The bill also provides for the timely entry of Bell operating companies into electronic publishing and alarm services. Despite passage of both Senate and House measures by overwhelming margins, controversy over selected provisions contained in the telecommunications reform measures insure that further modification of the legislation will be sought during the House/Senate conference.

John Shadegg, Congressional Representative, 4th District, Arizona

Pending FCC Initiatives:

The Federal Communications Commission (FCC) has also entered a process to review and revise Universal Service in response to some shortcoming in hoped for telephone subscribership rates and in anticipation of competitive local markets. On July 13, 1995 the FCC adopted two Notices of Proposed Rule Making (NPRM) and a Notice of Inquiry (NOI) regarding Universal Service. The comment and reply period for all three have now concluded, but subsequent action has not yet been taken. The FCC will eventually refer its proposals to the federal-state joint board on jurisdictional separations for a recommended decision.

Increase Telephone Subscribership:

Notice of Proposed Rule Making (NPRM) FCC 95-281 seeks to address the fact that while the average telephone subscribership rate is 94%, it is substantially lower for certain population groups, namely African-American, Hispanic and Native American households as well as those who are unemployed, receive public assistance or are "mobile" in their lifestyle. Many households without phone service were once connected but subsequently disconnected for failure to pay long distance charges. LECs could be prohibited from disconnecting local service for non-payment of interstate long distance charges (already prohibited in Arizona by Administrative Code section R14-2-509 subsection 1c) or required to offer interstate long distance blocking options or preset monthly limits on time or expenditures.

The NPRM also seeks to explore the feasibility of revising or expanding Link-Up America to better serve low income subscribers in connecting (or reconnecting) phone service and similarly adapting Lifeline Assistance with the aim of improving their retention as consistent subscribers. Significantly, the FCC also will review expanding Lifeline Assistance to cover multi-line public institutions, such as schools and libraries, taking into account their community role within the National Information Infrastructure.

Reconsidering the USF for High Cost Areas:

Notice of Proposed Rule Making (NPRM) FCC 95-282 and its attached Notice of Inquiry (NOI) exhibit the FCC's interest that the distribution of the Universal Service Fund (USF) be more equitable and efficient and its concern that the current implementation of the fund in providing assistance to Local Exchange Carriers in high cost areas may act as "de facto barriers to competitive entry." The FCC states four principles to consider in evaluating its proposals:

- Assistance should be properly targeted so that support is given only to those service providers or users who need assistance to maintain local service.
- To promote efficient investment and operation, assistance should be delivered on a basis that is technology-neutral in order to avoid encouraging investment in specific types of facilities or technologies when other means could deliver local service at lower cost.
- To avoid suppressing usage of interstate toll services, the provision of high-cost assistance should not impose excessive subsidy costs upon interstate carriers and ratepayers.
- Our high-cost assistance rules should not impose barriers to competitive entry into local telecommunications, nor otherwise disrupt normal market forces.

Currently, USF subsidies are provided to LECs based on their reported costs to provide phone service in high-cost, primarily rural, areas. The FCC is considering a "high-cost credit," essentially a voucher, for each individual subscriber line in high-cost areas, allowing customers to choose a LEC who would then receive that credit. The high-cost credits may be limited to areas where local competition is established but issues as to determining the presence of competition and defining minimum service commitments remain.

The FCC is interested in more precisely targeting high-cost areas and may move from variable and usually large geographic areas to "Census Block Groups" of from 250 to 550 housing units as a basic geographic unit for which to calculate costs of service and subsidy levels. The current calculation are based on the LEC's reported costs of service but are being reconsidered. In the future, they may employ stricter guidelines in determining the LEC's costs or move to the use of proxy factors (such as subscriber density per square mile, average distance from nearest wire center, terrain, and climate) to calculate an objective high-cost basis independent of actual LEC costs. Yet a third option would be to apply such proxy factors to determine total support levels to be provided to each state, distribute the equivalent of block grants, and allow state Public Utility Commissions to design their own plans, in accordance with FCC guidelines, for distributing assistance to the LECs servicing high-cost areas.

The Dial Equipment Minute (DEM) weighting rules, allowing LECs with study areas of no more than 50,000 access lines to allocate a higher percentage of local switching costs to the interstate jurisdiction, may be revised or eliminated. And once competition for local telephone services is established, a system of competitive bidding by LECs to act as a "carrier of last resort" in specific Census Block Groups may be implemented. In an effort to control USF expenditures, assistance to any area that would total less than \$1 per line per month may be eliminated. Also under consideration is an indexed cap for the total USF with adjustments in eligibility thresholds to keep within that level. And finally a proposal is included to means-test Universal Service assistance for the intended individual telephone subscribers.

All in all, an enormous range of Federal legislative and regulatory reconsideration of telecommunications issues is underway, which will affect the definition and manner in which Universal Service is provided for decades to come. Unfortunately, until the results of the Congressional conference committee are known and the proposed legislation is acted upon, matters are not likely to become much clearer. Even then, it will take a year for the new Federal-State Joint Board to make its recommendations and the FCC to complete related hearings. If telecommunications reform legislation passes this session, matters will become increasingly well defined and understood through calendar 1996.

The ostensible goal of Universal Service is to make sure Americans of meager means can procure essential telecom services in high-cost areas at "just and reasonable rates." Fine and dandy. But does this require perverting the economic foundations of a \$100 billion industry? Has anyone asked whether there is a more direct way to help the poor, such as means-tested vouchers that can be used to procure services on the open market? Food is more important than phone calls, but we sure don't ship food stamps directly to Stop-and-Shop and Grand Union based on some weird geo-political formula of hard-to-feed locations. Yet that's exactly what we do in the telecom business.

Why is it that the regional Bells haven't adapted readily available technology to solve the problem of delivering basic services to high-cost areas? Could it have anything to do with the fact that all their costs get buried in the rate base, giving them a powerful economic incentive to remain inefficient? And just how is it a newcomer is supposed to compete if they can't outperform the incumbent in exactly those markets that are being uneconomically served? If telecom prices were allowed to reflect costs directly, undistorted by hidden taxes and subsidies, both the issues of cream skimming and red lining would go away.

Bill Frezza, President of Wireless Computing Associates in Communications Week, 11/27/95

Universal Service in the State of Arizona:

Over the last decade residential telephone subscribership in Arizona has caught up with national penetration averages. Between 1984 and 1993, the percentage of Arizona households with telephones rose from 86.9% to 93.4% (up 6.4%) while the national average rose from 91.4% to 94.2% (up 2.3%). In 1993, thirty four states exceeded Arizona's subscribership rate ranging up to a high of 97.3% (Pennsylvania). (Source : FCC Trend Report, February, 1995)

The Arizona Corporation Commission (ACC) is authorized by the state's constitution (Article XV) to "prescribe just and reasonable rates and charges to be made and collected, by public services corporations." Under its constitutional charter it is effectively another entire branch of state government with three popularly elected commissioners serving staggered, six-year, non-consecutive terms. Up until now, Arizona has not had as structured and rule-based a Universal Service fund as some states. A fund contributed to by LECs and toll service providers (but not by all connected to the public switched network) developed out of a Contel rate case in the late 1980's. They were acquired by GTE and subsequently, the service of the "study area" passed to Citizens Utility, who currently receives a rate subsidy of almost \$750,000 a year. They are the only firm supported from the current state Universal Service fund.

The Arizona Corporation Commission (ACC) worked with industry and consumer groups to develop a more comprehensive Universal Service policy and this past summer moved to establish a new Arizona Universal Service Fund (AUSF). Its purpose is "primarily to assure the availability and affordability of basic local exchange telephone service in areas that are predominantly rural" and to broaden the base of telecommunications providers contributing in a competitively neutral manner. The proposed rules will be before the commission in the first quarter of 1996 with attendant public hearings. Section R14-2-1201 of the rules defines the required features of "basic local exchange telephone service":

- Access to one-party residential service with a voice grade line
- Access to touch-tone capabilities
- Access to an interexchange carrier
- Access to emergency services (including but not limited to emergency 911)
- Access to directory assistance service
- Access to operator service
- Access to a white page directory listing
- Access to telephone relay systems for the hearing impaired

The rules require that all telecommunications service providers that interconnect to the public switched network provide contributions to the AUSF. Providers of basic local exchange service (or equivalent service) will provide one-half of the AUSF funding based upon total access lines (including business, residence, wireless, public access and others) assessed as an access line surcharge. This incorporates all wireless providers (including cellular, paging and Commercial Mobile Radio Service) that interconnect to the public switched network as well as any non-traditional providers (such as cable television companies) that choose to offer basic local exchange telephone service. A second category consisting of providers of intrastate toll service will provide the other half of the AUSF funding assessed as a percentage of their total Arizona intrastate toll revenue. All other types of telecommunications service providers that interconnect to the public switched network after the rules take effect can select which category of service provider they will join, irrevocable for at least 3 years.

Any Local Exchange Carrier (LEC) may seek AUSF support in conjunction with a rate request. The amount of support will be based upon the difference between the benchmark rates for basic local exchange telephone service provided by the carrier and the appropriate cost to provide service as determined by the ACC, minus any Universal Service support from federal sources. For small LECs (20,000 or fewer AZ

access lines), the AUSF support area includes all exchanges they serve. For intermediate LECs (more than 20,000 but less than 200,000 AZ access lines), the AUSF support area will be either all exchanges they serve in Arizona or a differently defined support area as approved by the ACC. Any requests by intermediate LECs for AUSF support more than three years after the new rules become effective or by large LECs (more than 200,000 AZ access lines) any time after the rules become effective, will be based on U.S. Census Blocks (small geographic areas) and the Total Service Long Run Incremental Cost, based on incremental costs given that the requester is already providing other services and is further based on the least cost, most efficient technology capable of being implemented at the time.

Once the ACC approves AUSF support to a provider for a defined area, that support will also be available to competitive providers calculated on a per customer basis, at the same level at which the incumbent provider receives support. US West will serve as interim Administrator of the AUSF for a transition period pending appointment of a private, neutral third party no later than July 1, 1996. The ACC will review the implementation of the AUSF within three years to recommend any necessary changes. //

The Federal Universal Service Fund (USF) assistance (or jurisdictional shift) from the National Exchange Carrier Association (NECA) for Arizona in 1995 (capped) is \$14.5 million. Direct subsidies are provided to Local Exchange Carriers servicing high-cost areas, whose costs exceed 115% of the national average. NECA's 1995 disbursements are based on 1993 year end costs. The estimated 1996 figures are based on 1994 year end costs and still subject to modification by pending cap adjustments and USF rule alterations.

	1995 \$	Est. 1996 \$
Arizona Telephone Company	198,720.	224,712.
Citizens Utilities Company (DBA Citizens - Arizona)	0.	3,809,881.
Citizens Utilities Rural Company Inc.	3,035,350.	5,117,916.
Contel of California - Arizona	540,002.	1,133,970.
Contel of West Inc. (dba GTE of West AZ Inc.)	4,647,822.	0.
Fort Mohave Telecommunications Inc.	172,682.	347,506.
Gila River Telecommunications Inc.	751,386.	623,490.
Midvale Telephone Exchange Inc.	68,003.	118,368.
Mountain Bell - Arizona	0.	0.
Navajo Communications Company Inc.	3,626,250.	2,804,696.
Southwestern Telephone Company	0.	18,776.
Tohono O'Odham Utility Authority	354,382.	322,946.
Universal Telephone Company of Southwest Arizona	100,978.	98,840.
Valley Telephone Cooperative Inc.	970,338.	1,004,738.
Arizona Total NECA USF Subsidies	14,465,913.	15,625,839.

The FCC first certified Arizona for participation in Lifeline Assistance in 1986 followed by Link-Up America in 1988. In 1994, NECA provided \$308,402 in SLC waiver subsidies matched by the state to 9,146 Arizona subscribers and \$8,533 in Link-Up America subsidies to 367 Arizona subscribers. A Telecommunications Relay Service (TRS) has been in statewide operation since 1987 including toll-free access and funded by a surcharge on 911 revenue. Handicapped telephone subscribers are eligible for a 35% discount on direct dialed intraLATA toll calls and for the waiving of directory assistance charges. Since 1991, the Arizona Department of Economic Security (DES) has run the Telephone Assistance Program (TAP), subsidizing residential telephone subscriber costs for almost 7,000 households with low incomes and certifiable medical problems. It is funded by US West and serves only their customers.

Five Arizona telephone companies (Arizona Telephone Co., Citizens Utilities Rural Co., Gila River Telecommunications Inc., Tohono O'Odham Utility Authority, Valley Telephone Coop Inc.) currently participate in the USDA Rural Utilities Service (RUS) program for rural telecommunications loan support.

Universal Service Around the Nation:

In order to help policy makers better understand the current and future status of Universal Service in the United States, International Research Center conducted structured telephone interviews with a key informant in each of the 50 states and the District of Columbia, either senior level staff or Commissioners involved in telecommunication policy formulation in their state. Interview questions focused on:

- Status of Universal Service in the state and any pending actions
- Description of the states Universal Service program, if the state had one, including target groups
- Description of the Universal Service Funding mechanism, if the state had one
- State's participation in Federal programs that support Universal Service
(Lifeline, Link-up America, High Cost)
- Definition of "basic service"
- Rates and types of technology used to provide "basic service"
- Public/private partnerships used to promote Universal Service/Universal Access
- State programs promoting access to advanced information services
- State programs to provide electronic access to public/government records and documents.

Information gathered from these interviews was supplemented with other secondary information for each state. This secondary information included demographic information about the state's population, geographic size, and median income; census data on poverty levels (percent on public assistance and percent below poverty); FCC data on the state's telephone system (number of LECs, penetration rate, technology), and data from a study on rural LECs conducted by the Organization for the Protection and Advancement of Small Telephone Companies (OPASTCO). In addition, key informants in states which had or were actively involved in developing a Universal Service program forwarded copies of relevant legislation, commission orders, and staff proposals.

Information gathered through the interviews was combined with the secondary data to generate a profile for each state. These profiles are included in Appendix E. To ensure the accuracy of the state profiles, a draft profile was faxed to the key informant in the state for review and modification. Changes were made to 26 state profiles based on key informant comments. In a number of cases, the changes updated the secondary data with more current information. Information from the state profiles was then aggregated into a number of matrixes which are presented and discussed below.

What is "basic service"?

Consistent with the Federal definition, states have defined Universal Service as the availability of telephone service at reasonable rates to all citizens in the state. Basic service, on the other hand, has been defined by a limited number of states, and those definitions vary from state to state. Table 1 shows the states that have defined basic service and the elements included in their definitions. Asterisks (*) indicate states with definitions that are pending. Twenty-five states have a pending or approved definition of basic service at this time. Based on these definitions basic service in the United States typically consist of a single party (16) voice grade (18) touch tone (20) line with access to emergency services (23), directory assistance (16), operator services (14), long distance services (17), and a white page listing (18). A number of states also include Telecommunication Relay Services (TRS) for the hearing impaired (8). These are the identical elements as in the Arizona Corporation Commission's proposed definition for basic service in Arizona.

Less common elements included in the definition of basic service are a modem capable line (6), privacy protection (6), and access to repair services (5). The most unique services included are a required usage element (Connecticut and Ohio), non-published service (New York), access to optional digital services (Alaska), ANI capability (Connecticut), access to custom calling features (Missouri and Oklahoma), toll

Table 1: State Definitions of Basic Telephone Service

State	Single party	Multi-party	Touch tone	Rotary	Voice grade line	Fax grade line	(911)	(411)	Operator services	White page listing	Long-distance access	Modem capable	Repair services	Privacy protect	Other
Alaska*	Yes		Yes		Yes		Yes	Yes			Yes		Yes		Access to optional digital services
Arizona*	Yes		Yes		Yes		Yes	Yes	Yes	Yes	Yes				Telecomm relay services
California			Yes		Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Colorado	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	2400	Yes	Yes	
Connecticut	Yes		Yes		Yes		Yes	Yes	Yes	Yes	Yes			Yes	ANI Capability, Usage element
Delaware				Yes			Yes	Yes	Yes	Yes					Switch/relay access
Florida			Yes		Yes		Yes	Yes	Yes		Yes				Flat rate residential
Georgia	Yes		Yes				Yes					9600			1+ dialing
Hawaii*	Yes		Yes		Yes		Yes	Yes	Yes	Yes					Access to relay services
Louisiana	Yes		Yes				Yes	Yes	Yes	Yes	Yes				Affordable line connection; Telephone relay service; Customer support
Massachusetts															Unlimited calling in local exchange calling area
Michigan										Yes					Dial tone
Missouri	Yes		Yes		Yes		Yes				Yes				Access to custom calling features
Nevada			Yes		Yes		Yes			Yes	Yes				Dial tone
New Jersey	Yes	Yes		Yes	Yes		Yes			Yes	Yes		Yes	Yes	
New York*			Yes		Yes		Yes	Yes	Yes	Yes	Yes			Yes	Exchange access; Statewide relay service; Non-published service; Direct inward dialing
North Carolina*	Yes		Yes		Yes										Flat rate local calling
Ohio*	Yes		Yes		Yes		Yes	Yes	Yes	Yes	Yes	14400	Yes	Yes	Usage packet (400 minutes); Telecomm relay services
Oklahoma	Yes		Yes				Yes			Yes		Yes			Custom calling features available
Oregon	Yes		Yes		Yes		Yes	Yes	Yes	Yes	Yes				Toll blocking; Relay services
Pennsylvania	Yes		Yes		Yes		Yes	Yes	Yes	Yes	Yes				Disability services; Access to incoming and outgoing calls
Tennessee			Yes		Yes		Yes			Yes					Access line; Telecomm relay services; Educational discounts
Vermont			Yes		Yes		Yes	Yes				Yes			Enhanced 911 services; Telecomm relay services
West Virginia*							Yes	Yes	Yes	Yes	Yes				Telephone number; Local call switching; Telecomm relay services
Wisconsin*	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes	9600			Telecomm relay services; Toll blocking; Annual directory; Reasonably adequate calling area
Wyoming	Yes				Yes		Yes				Yes				Residential or business; Flat or measured rate
Total	16	1	20	2	18	2	23	16	14	18	17	6	5	6	(* - Definition Pending) (Page 15)

blocking capability (Oregon and Wisconsin), educational discounts (Tennessee), and an annual directory (Wisconsin). While 25 states and DC did not have a definition of basic service at this time, a number of states are developing them in conjunction with open dockets on local competition or Universal Service.

What does “basic service” cost?

Table 2 shows the residential telephone rates (R1- flat rate) for the BOC in each state, and the range of rates for the LECs in each state. Since this information was not available from a secondary source, we relied on the key informant in each state to provide this information. Specifically, the key informant was asked what the rate would be for “basic service”. Given the complexity of rate structures in some states, the variations in telephone service across the states, and the fact that half of the states don’t have a definition for basic service, the rate information should be viewed with caution. Perhaps as more states develop definitions of “basic service”, it will be possible to develop a better overall picture of the price of basic service in the United States and what customers should expect to pay for basic service. In Table 2, states with definitions of basic service are identified by asterisks.

In spite of these qualifications, there are a number of interesting patterns within the data. First, in some states the BOC has a single statewide residential rate, while in others there are a range of rates depending generally on the subscribers geographic location and calling area. The lowest reported rate for a BOC was in DC. DC, however, does not have a definition of basic service, has only one LEC, and this is a special rate for low income households. Of the states with a definition of basic service, Wisconsin has the lowest BOC rate (\$5.40 for measured service) and New York has the highest rate (\$22.27). The average rate for “basic service” for states with a definition is \$11.95. In four small states, there is only one LEC, typically the BOC (Delaware, DC, Hawaii, Rhode Island). The number of LECs in the remaining states range from 2 (Maryland) to 160 in Iowa. The range in residential rates for LECs in almost all states was greater than the range of rates for the BOC. Thus, there are some LECs in each state with lower rates for residential service than the BOC and some with higher rates. LECs with the lowest rates typically have very limited calling areas, while LECs with the higher rates are in high cost/rural areas. Again, looking at those states with a definition of basic service, the lowest LEC rate was in North Carolina (\$2.56) and the highest was in West Virginia (\$36.00). The average of the lowest LEC rate for states with a definition was \$7.30 and the average of the highest rates was \$18.00.

Table 2 also presents results from the OPASTCO study (last three columns) which provides insights into the costs of providing basic service in rural/high cost areas. In 1994, OPASTCO examined the consequences of changes in FCC regulations that would eliminate federal support mechanisms for small rural LECs (i.e., DEM weighting, 25% gross allocator, USF, and federal Lifeline and Link-up America programs). The first column in this section of Table 2 shows the local service revenues per subscriber per month for small rural LECs included in the OPASTCO study group. The average for the 424 LECs included in the study group was \$15.31. The second column shows OPASTCO’s estimate of the average local service revenues per subscriber per month that would be required if federal supports were eliminated. The average for the study group was \$28.75. This means that, on average, local service revenues would have to go up by 72.3%, if federal supports were eliminated. Required revenue increases vary widely from state to state with greatest estimated increases being in New Mexico (228.8%), Texas (176.1%), North Dakota (170.4%), Idaho (157.6%), and Nebraska (154.4%). OPASTCO also surveyed a random sample of the study group’s subscribers to determine the impact the estimated rate increase might have on continued telephone service. Twenty percent of the subscribers said they would discontinue service if the rates were increased to the estimated level.

Arizona’s average local service revenues per subscriber per month in the OPASTCO study group (\$21.05) was above the overall average (\$15.91), but the percent increase in revenues needed, 47.8%, was less than the national average. This still reflects an average estimated increase in local service revenues of \$9.64 per

Table 2: State Residential Telephone Rates

State	Bell Operating Co.		Local Exchange Carriers			OPASTCO Study		
	BOC	Rates	Number of LECs	Lowest Rate	Highest Rate	Rev/ Customer	Rev w/o Subsidy	% Increase
Alabama	Bell South	\$16.00-15.00	34			\$18.94	\$30.42	60.6%
Alaska*	na	na	23	\$5.00	\$30.00	\$20.94	\$34.73	65.9%
Arizona*	US West	\$13.18	14	\$4.50	\$21.00	\$21.05	\$30.69	47.8%
Arkansas	SW Bell	\$14.00	27	\$5.00	\$32.00	\$16.71	\$28.66	71.5%
California*	Pacific	\$11.25	23	\$11.25	\$17.80	\$20.64	\$48.77	136.9%
Colorado*	US West	\$17.82	36	\$4.15	\$30.00	\$21.31	\$36.10	69.4%
Connecticut*	NYNEX	\$12.50	3	\$8.00	\$15.00	na	na	na
Delaware*	Bell Atlantic	\$9.40	1	\$9.40	\$9.40	na	na	na
Dist. of Col.	Bell Atlantic	\$3.00-14.60	1	\$3.00	\$14.60	na	na	na
Florida*	Bell South	\$10.65	13	\$6.00	\$11.63	\$16.77	\$30.32	80.8%
Georgia*	Bell South	\$14.33	36	\$4.00	\$18.00	\$18.12	\$32.09	77.1%
Hawaii*	na	na	1	\$14.40	\$14.40	na	na	na
Idaho	US West	\$11.61	16	\$9.40	\$17.20	\$14.51	\$37.37	157.6%
Illinois	Ameritech	\$11.20	56	\$5.40	\$28.00	na	na	na
Indiana	Ameritech	\$13.50	43	\$3.00	\$25.00	\$16.19	\$24.75	52.9%
Iowa	US West	\$11.05-13.05	160	\$2.00	\$24.78	\$13.92	\$24.40	75.3%
Kansas	SW Bell	\$11.00	45	\$3.50	\$13.00	\$13.55	\$28.07	107.2%
Kentucky	Bell South	\$18.00	20	\$5.00	\$18.00	na	na	na
Louisiana*	Bell South	\$10.97-15.05	21	\$9.00	\$18.50	\$21.95	\$44.24	101.5%
Maine	NYNEX	\$10.50-12.50	24	\$4.75	\$14.50	\$11.09	\$25.63	131.1%
Maryland	Bell Atlantic	\$9.52-11.17	2			na	na	na
Massachusetts*	NYNEX	\$16.85	5			na	na	na
Michigan*	Ameritech	\$10.38	38	\$3.76	\$12.30	\$11.31	\$19.87	75.7%
Minnesota	US West	\$14.10	103	\$5.00	\$30.00	\$15.25	\$23.02	51.0%
Mississippi	Bell South	\$14.85- 19.00	20	\$11.50	\$18.00	\$21.40	\$39.36	83.9%
Missouri*	SW Bell	\$7.55-12.50	42	\$4.00	\$16.00	\$13.91	\$26.02	87.1%
Montana	US West	\$13.84	8	\$7.10	\$16.38	\$13.39	\$31.70	136.7%
Nebraska	US West	\$14.90	42	\$4.00	\$15.00	\$12.90	\$32.83	154.5%
Nevada*	Nevada Bell	\$10.00	13	\$5.75	\$16.00	\$15.56	\$30.86	98.3%
New Hampshire	NYNEX	\$18.00	14	\$6.00	\$9.00	\$11.20	\$22.04	96.8%
New Jersey*	Bell Atlantic	\$7.00-8.00	3	\$5.30	\$8.30	na	na	na
New Mexico	US West	\$10.96-15.86	14	\$10.96	\$15.86	\$16.26	\$63.22	288.8%
New York*	NYNEX	\$12.45-22.27	40	\$3.84	\$17.92	\$16.33	\$26.15	60.1%
North Carolina*	Bell South	\$9.94 -13.94	20	\$2.56	\$18.26	\$19.07	\$23.94	25.5%
North Dakota	US West	\$12.00	29			\$14.22	\$38.45	170.4%
Ohio*	Ameritech	\$15.25	42	\$2.70	\$22.90	\$18.31	\$21.88	19.5%
Oklahoma*	SW Bell	\$9.50-13.00	47	\$5.00	\$20.00	\$13.94	\$33.84	142.8%
Oregon*	US West	\$12.80	33	\$8.00	\$16.00	\$15.99	\$29.31	83.3%
Pennsylvania*	Bell Atlantic	\$8.20-12.95	38	\$3.25	\$17.73	\$12.09	\$24.96	106.5%
Rhode Island	NYNEX	\$7.50-22.00	1	\$7.50	\$22.00	na	na	na
South Carolina	Bell South	\$14.20-16.90	28	\$3.00	\$16.90	\$18.37	\$24.80	35.0%
South Dakota	US West	\$12.00-15.20	31	\$5.25	\$15.75	\$11.85	\$28.20	138.0%
Tennessee*	Bell South	\$7.50-12.15	18	\$6.00	\$13.00	\$16.67	\$22.83	37.0%
Texas	SW Bell	\$8.15-11.05	58	\$5.05	\$19.00	\$15.55	\$42.94	176.1%
Utah	US West	\$3.50 -7.98	14	\$10.00	\$12.00	\$12.60	\$29.13	131.2%
Vermont*	NYNEX	\$12.75	9	\$6.00	\$16.00	\$15.15	\$28.68	89.3%
Virginia	Bell Atlantic	\$8.51-14.82	21	\$6.00	\$16.35	\$13.05	\$25.94	98.8%
Washington	US West	\$8.75-12.75	26	\$7.00	\$26.00	\$13.10	\$25.94	98.0%
West Virginia*	Bell Atlantic	\$15.80	9	\$22.00	\$36.00	\$25.56	\$49.37	93.2%
Wisconsin*	Ameritech	\$5.40	86	\$2.90	\$25.00	\$13.49	\$17.45	29.4%
Wyoming*	US West	\$12.64-14.64	14	\$5.75	\$16.80	\$16.05	\$35.26	119.7%

(Note: * indicates states with a definition of basic service)

subscriber per month for customers served by Arizona's 13 rural LECs. Thirteen percent of those surveyed by OPASTCO in Arizona said they would disconnect service if rates went up by that amount. This would equate to 9,700 access lines in rural Arizona. The OPASTCO study findings are important since they highlight one of the biggest issues related to Universal Service; that is, how to provide affordable telecommunication services to rural areas which have significantly higher costs than urban areas. The study provides an indication of what the actual costs are to provide telephone service in high cost areas, and the possible consequences of federal and state governments not taking necessary steps to maintain Universal Service in the new competitive telecommunication market.

How is "basic service" delivered?

Table 3 shows the types of technology used to provide telephone service in each state. Again, asterisks indicate states with a definition of basic service. Each year the FCC aggregates data on the types of equipment LECs have deployed, as reported by the LECs. The FCC has considerable information about telephone equipment in each state, but much of it is beyond the scope of this project. One general indicator of the level of the technology used to provide basic service is the extent to which the local loop circuit is digital or analog. Using FCC data on the "total equipped local loop circuit", the percent digital was calculated for each state (see column 1). Overall, 39% of the local loop is digital, but there are wide variations between states. In five states the local loop circuit is all digital, and in 18 other states including Arizona the local loop is more than 95% digital. States with relatively low levels of digital circuits included California (9.61%), Louisiana (10.58%), Massachusetts (6.95%), Nevada (10.36%), New York (8.41%), and Rhode Island (9.57%).

The key informants were also questioned about the type of technology used to provide basic service both in the "last mile" and in the infrastructure. All informants indicated that they used both copper and fiber optic to deliver basic service. Twisted pair into the residence, with copper and fiber in the infrastructure was the primary reported technology. Three states also were installing Hybrid Fiber Optic cable and 17 were using some microwave. Key informants were also asked if there were any unique technologies used to provide service, especially to rural areas. Nine states reported using Basic Exchange Telephone Radio Service (BETRS) and three reported using fixed cellular to provide basic service to isolated areas of their state, and one mentioned satellites (Alaska).

In summary, basic telephone service, for those states that have defined it, typically is a single party voice grade touch tone line with access to emergency services, directory assistance, operator services, long distance services, and a white page listing. The rates for basic service for BOCs is around \$12.00 per month, but can cost be as much as \$22.27 per month or as little as \$5.40, and LECs may have rates exceeding \$30.00 per month. Basic service is typically provided using twisted pair copper wire into the house with a mixture of fiber and copper in the infrastructure, although some remote areas require wireless technologies.

What is the status of Universal Service programs in each state?

In order to make telephone service available and affordable to all citizens, federal programs have been put in place to support Universal Service in every state and some states have developed their own Universal Service programs. The oldest state program was established in California in 1983. Given recent trends toward deregulation of telecommunications and the introduction of local competition, almost every state is now involved to some degree in examining or reexamining Universal Service. For states which have had a Universal Service program, like Arizona, this has led to a comprehensive change in the program. States which have not had a Universal Service program have responded quite differently. Some are just beginning to examine the issue, wondering if they need a fund. Others are finishing up the rule making process, and will be soon establishing their state's first Universal Service program. This section of the report examines

Table 3: State Telecommunication Technologies for Providing Basic Service

State	Percent Local Loop Digital	Copper	Fiber Optic	Hybrid Fiber	Microwave	Other
Alabama	18.59%	Yes	Yes			
Alaska*	na	Yes	Yes		Yes	Satellite, BETRS
Arizona*	98.47%	Yes	Yes		Yes	BETRS
Arkansas	99.41%	Yes	Yes			ISDN
California*	9.61%	Yes	Yes			
Colorado*	94.04%	Yes	Yes	Yes	Yes	ISDN on 70% of lines
Connecticut*	90.87%	Yes	Yes	Yes		
Delaware*	100.00%	Yes	Yes			ISDN
District of Columbia	100.00%	Yes	Yes			
Florida*	35.43%	Yes	Yes			95% Digital Switches
Georgia*	27.79%	Yes	Yes		Yes	
Hawaii*	73.23%	Yes	Yes		Yes	
Idaho	98.91%	Yes	Yes		Yes	95% Digital Switches
Illinois	95.26%	Yes	Yes			
Indiana	99.46%	Yes	Yes			
Iowa	92.32%	Yes	Yes			
Kansas	100.00%	Yes	Yes			
Kentucky	17.70%	Yes	Yes			
Louisiana*	10.58%	Yes	Yes			
Maine	14.21%	Yes	Yes		Yes	BETRS
Maryland	100.00%	Yes	Yes		Yes	
Massachusetts*	6.95%	Yes	Yes			
Michigan*	99.96%	Yes	Yes			
Minnesota	99.78%	Yes	Yes			
Mississippi	16.44%	Yes	Yes			
Missouri*	94.93%	Yes	Yes		Yes	Fixed cellular
Montana	76.27%	Yes	Yes		Yes	BETRS
Nebraska	72.15%	Yes	Yes		Yes	
Nevada*	10.36%	Yes	Yes	Yes		Fixed cellular, BETRS
New Hampshire	12.92%	Yes	Yes		Yes	
New Jersey*	99.98%	Yes	Yes			
New Mexico	99.02%	Yes	Yes		Yes	BETRS
New York*	8.41%	Yes	Yes			
North Carolina*	23.00%	Yes	Yes			
North Dakota	84.82%	Yes	Yes			
Ohio*	96.88%	Yes	Yes			ISDN
Oklahoma*	99.70%	Yes	Yes			
Oregon*	98.63%	Yes	Yes		Yes	BETRS
Pennsylvania*	99.20%	Yes	Yes			
Rhode Island	9.57%	Yes	Yes			
South Carolina	25.01%	Yes	Yes			
South Dakota	66.30%	Yes	Yes		Yes	
Tennessee*	19.96%	Yes	Yes			ISDN
Texas	99.00%	Yes	Yes			
Utah	98.03%	Yes	Yes			
Vermont*	14.27%	Yes	Yes			
Virginia	99.74%	Yes	Yes			
Washington	97.73%	Yes	Yes			ISDN, BETRS
West Virginia*	100.00%	Yes	Yes			
Wisconsin	96.22%	Yes	Yes		Yes	
Wyoming*	67.96%	Yes	Yes		Yes	Fixed cellular, BETRS
AVG./TOTAL	39.02%	51	51	3	17	

(Note: * indicates states with a definition of basic service)